October 16, 2002

Ken Ammon, Director
Water Supply Department
South Florida Water Management District
P.O. Box 24680
West Palm Beach, FL 33416-4680

Dear Ken:

I have attached for your review the technical and specific comments provided by DEP staff on the District's July 15, 2002 Draft *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary.* I have separated the comments into two categories: those concerns related specifically to the methodologies used to develop the MFL criteria, and those comments that are more editorial in nature. Please understand that there is probably some overlap between the two categories.

As you know we have other concerns related to the Loxahatchee River, which are not reflected in the attached comments. We appreciate the opportunity to continue our discussions regarding:

- the use of multiple levels when establishing MFLs,
- the role of MFLs to help achieve restoration,
- the role of reservations in restoring the river,
- establishing restoration targets for the river,
- the role of CERP in providing restoration to the river, and
- the relationship between consumptive uses in the basin and the MFL.

If you have any questions or would like to discuss the attached comments further, please contact me at 850-245-8681.

Sincerely,

Kathleen P. Greenwood
Government Analyst II
Office of Water Policy

Attachment

Technical Comments on Methodology Used to Develop Loxahatchee MFL Criteria (July 15, 2002 Draft)

1. Page 79, Modeling Assumptions. To use all of the contributions of the tributaries (Kitching Creek, Hobe Grove Ditch, etc) as a constant fraction of the freshwater discharge at Lainhart Dam and a constant ground water input of 40 cfs under all conditions is an unreliable assumption for the modeling effort. The amount of water contributed by groundwater should vary according to the hydrological conditions.

2. Page 84 and 86. River Vegetation Surveys. More explanation is needed regarding the non-random criteria used to select survey sites. Additionally, the District should explain why the transects were not conducted along a line perpendicular to the river which would appear to characterize the floodplain community more fully than a transect that was 25' wide and ran parallel to the river.

3. Page 86, Soil Salinity Surveys. Soil sample transects should have corresponded with vegetative transects or a vegetative survey should have been conducted along the soil sample transects.

4. Page 98. Table 24 and Figure 19 provide a comparison of both "historical" and more "current" flow conditions over the Lainhart dam. Without any explanation, historical conditions are defined as time period from 1977 through 1989, and current conditions are defined as 1990 through 2001. The proposed MFL criteria goes on to identifying "historical" operations as those average 1977 through 1989 flows provided by Table 24. It is not clear how the historical and current time periods were selected, or justified for the comparison. Nor is it clear why the G-92 installation date (1987) was not selected for the comparison purposes when comparing the "historical" data to that of the more recent data.

5. Page 98. Table 24 shows that historic flow over Lainhart was less than 35 cfs 73 times during 1990-2001. How often was the flow less than 35 cfs for more than 20 days (the proposed MFL harm criterion)? How often did this happen more than once in a six-year period (the proposed MFL significant harm criterion)? From the information found in the document, it is not really clear how the proposed MFL criteria relates to existing flow conditions.

6. Page 98, Table 24. When comparing "historical" data with "current" data for the purpose of showing that current and historical conditions are similar for low flow conditions, one need to compare periods of similar rainfall conditions. The comparison provided in Table 24 shows that the percentage of time that the flows fall below the 20 cfs and 15 cfs is approximately the same for the historical and current conditions, with the current time period having above average rainfall and the historical time period being dry. From this one should not automatically conclude that the current conditions are not degrading at the low flow rates, and that no harm has occurred.

7. Page 101, Table 25. The average historical salinity for the river and its tributaries range from 0.3 to 2.5 during times that the river experienced declines in freshwater floodplain community. Isn't it reasonable to conclude that even salinities as low as these caused harm? The aerial photograph analysis doesn't support conclusion on

page 102, paragraph 2, that the upstream portions have been more impacted by salt water during the past decade. Additionally, the statement on page 102, contradicts other statements in the document that the impacts to the floodplain community have remained relatively stable since 1985.

8. Page 102, Soil Salinity Survey. The soil salinity in this survey was determined by analysis for conductivity and chlorides of soluble salts in the soil water. Soluble salts in the soil water resulting from salinity intrusion may not necessarily stay in the soil for long periods of time. The soluble salt levels are highly transitory with river flow, particularly if the soils are sandy soils. Therefore, salinity of soil pore water is not a good indicator of past long-term salinity effects. Additionally, the narrow scope of the survey should preclude the District from making any conclusions about the results.

9. Page 107, first paragraph. This section does not provide a reasonable estimate of the consumptive use. Appendix I presents a table (page I-7) that shows that under drought conditions (1988-1989) average flows are 41 cfs at the Lainhart dam, and estimates an increase to 55 cfs under a no pumping (no consumptive use) model run. The "5 cfs" professional estimate needs should be explained in more detail and should be linked with the modeling observations of Appendix I. Also there should be an explanation of why the proposed MFL is lower than the existing 41 cfs predicted by this model, including a discussion of the accuracy of the modeled predictions.

10. Page 113, Table 29. The reference "Tobe, et al. 1998" is not an appropriate reference for salinity tolerance of the species listed in the table. This reference is a plant identification manual and gives generalized habitat descriptions. It does not describe the salinity tolerance of the species listed in the table. Other more specific references should be found and used or the text should clearly explain that this reference provides generalized information regarding species habitat.

11. Page 134, Species Selected. While the District makes a reasonable argument for excluding herbaceous and canopy species from the Valued Ecosystem Community analysis, it appears to be too limiting. The canopy species could be included as an indicator of the very long-term conditions, while the herbaceous species could be included as an indicator of short-term conditions. All strata should have been analyzed during the vegetation surveys to give a more complete picture of health of the river's plant communities. A more detailed study that includes a larger assortment of species is needed. Additionally, as the District refines the MFL analysis of the other segments of the ecosystem need to be done including the benthic invertebrateand vertebrate populations.

12. Pages 136-141. Application of Modeling Tools. Throughout this section it is not clear why an average salinity of 2 ppt was chosen. The analysis shown in Figure 32 appears not to be average salinities but discrete salinity values. Table 34 shows the average salinities derived from Figure 32. The entire section seems misleading and implies that river mile 10.2 experienced an average salinity of 2 ppt, when the analysis shows average salinities were estimated at 0.154 ppt. From Table 34 it

appears that the section of the river experiencing an average salinity of 2 ppt, was somewhere between River Mile 8.9 and 8.6. It appears that many different statistics were combined to form the MFL without an adequate explanation. The flows were derived from the one model, while the duration and frequency were derived from an entirely different analysis.

13. Pages 136-141. Salinity Threshold. The document mentions that "a numbers of previous authors have identified the 2 ppt threshold as being an effective indicator of saltwater contamination because this concentration is significantly higher than background concentrations of salts ...". The authors also presented evidence that salinities of 2 ppt may not kill established cypress tress. We believe the salinity threshold should instead be based on protecting the six valued ecosystem component species (pond apple, dahoon holly, red maple, red bay, pop ash, and Virginia willow) since they are more sensitive to salinity than bald cypress (Page 113). Evidence presented in the report showed that these six taxa were classified as strictly freshwater taxa, suggesting that adverse effects to these taxa would occur at even 1 ppt. Therefore, we believe that the MFL model should use 1 ppt instead of 2 ppt when considering significant harm.

14. Page 140, Table 37. From table 34, the model results indicate that the average salinity at river mile 10.2 was 0.154 ppt. Yet to determine a flow regime to mimic the salinity depicted in Figure 32, the District uses an average salinity of 2 ppt. When determining the appropriate flow from table 37 to maintain mean salinity levels, why was a mean salinity of 2 ppt used instead of 0.154 ppt?

15. Page 138, Table 35 and page 145, Table 40. There was some confusion regarding which duration and frequency data were used in the model. The results produced by the 30-year model simulation show that at RM 10.2, salinities above 2 ppt occurred for 22 days every 2157 days (5.9 years) in the last 30 years. Solely based on this result, the document defines the salinity threshold (2 ppt), duration (20 days), and frequency (once every six years) to set the minimum flow for RM 9.2. However, we feel the technical support for the duration and frequency defined is not adequate. The document refers to Table 40 to set the minimum flow of 35 cfs. In Table 40, however, a category for 2 ppt and 30 days/4 years is defined, but a duration and frequency category of 20 days/6 years is not found. Which is the correct model input?

16. Pages 146-149. What will be the effect of the proposed MFL on the frequency, duration, and flooding of the swamp floodplain community? Most of the analysis focuses on moving the salinity wedge within the river's channel, but does not appear to take into account the certain hydrological requirements of the VEC community within the floodplain. Can the District provide an analysis of the effect of the proposed MFL on the frequency, duration, and depth of inundation to the floodplain?

17. Page 148, Proposed Minimum Flow Criteria. It appears that the proposed criteria could allow multiple instances where the flow could go very low, even to zero, during a single year and the MFL would not be considered violated. For instance, you could

have 20 consecutive days of flow under 35 cfs (as low as 0) followed by a day (it could be less) of flow of at least 35 cfs. If this cycle is repeated throughout the year it implies that the river could get no more than 35 cfs for 18 days a year (4.9% of the time) and still meet the criteria. We understand that this is not the intent of the criteria, and suggest that it be rewritten to avoid this misinterpretation.

18. Page 148, Proposed Minimum Flow Criteria. While the approach to recreate salinity conditions found at an apparently healthy section of the river further downstream appears to be reasonable, the criteria used to describe this condition does not appear to adequately describe the conditions. For instance, the salinity results indicate that salinities above 3 ppt. did not occur at river mile 10.2, yet the proposed MFL criteria could allow salinities to exceed 3 ppt for 20 consecutive days, which would seem to cause significant harm.

19. Appendix E, pages E-22 and E-23. When comparing the real time salinity data with the model run predictions it appears that the model is much more influenced by tidal fluctuations (influence of the inlet), than what was observed in the real time data. During low flow conditions, the model continuously shows salinity variations of the order of 10 ppt whereas the real time data shows variations of the order of 2 to 3 ppt (Figures 2 and 3). There needs to be a discussion on the reasons for these observed salinity range variations, why the predicted fluctuations are so much greater in the model run, than what was observed in the field data, and how these variations are accounted for when selecting the MFL. How much of these variations are due to the fact that the hydrodynamic salinity model does not consider the groundwater influence and fluctuations?

20. Appendix O. Based on a review of Tables O-1 and O-3, it appears there was approximately a 30,000 acre-feet/year increase in urban water supply demands between 1995 and 1999. Is this correct? Table O-4 indicates a total **allocation** of 58,081 acre-feet/year for 1999, whereas Table O-3 indicates a total **demand** of 58,081 acre-feet/year.

Specific/Editorial Comments (July 15, 2002 Draft)

1. Page iii, fourth paragraph. While lack of data may be an appropriate reason for not establishing a MFL for the North Fork of the Loxahatchee River, the inability to regulate flow from the North Fork is not an adequate reason to not establish a MFL for the North Fork. Additionally, the highly altered nature of the Southwest Fork is not an appropriate reason for not establishing an MFL. If either of these two water bodies is expected to be harmed from withdrawals, then a MFL should be established.

2. Page 1, third line from bottom. Replace "and" with "can."

3. Page 1, last paragraph. This is the only place in the document that refers to "periodic large volume fresh water flows" that impact the resource. Does the District know the impacts of the large volume flows? If not, does the District plan to evaluate the impacts of these flows and take appropriate management actions?

4. Page 5, Figure 1. This figure indicates that reservations are only in effect for hydrologic conditions less severe than a 1-in10 drought event. Please revise this drawing to show that reservations will be implemented during all hydrologic conditions.

5. Page 10, third paragraph. This paragraph should also include a reference to the *Proposed Restoration Vision for the Northwest Fork of the Loxahatchee River* as developed jointly by DEP and SFWMD.

6. Page 12, Figure 4. The figure should include rainfall for year 2001 (also noted that x axis labeling is off for the 2000 mark).

7. Page 16, second paragraph. The Loxahatchee River has never been designated a State Wild and Scenic River.

8. Page 17, Table 1, and Page 97, Table 23. Please provide summary of average wet season and dry season flows that occurred during the 1971 and 1999-2001 drought periods. While the tables reflect that an average of 70 cfs flows to the Loxahatchee Estuary during the dry season for the period of record, the statistical medians and modes of the flow events discharging through the Northwest Fork of the Loxahatchee River should also be provided (i.e. how many days of 0 cfs events).

9. Page 17, Table 1. This table indicates an average daily dry season flow of 70 cfs over the Lainhart Dam. Coupled with other tributary flows a total of 125 cfs is provided to the river during the dry season. These are average conditions and flows may fall to 10 cfs or lower. Similarly, wet season average flows are 185 cfs but frequently exceed this during the wet season. Nevertheless, the dry season/drought conditions are the primary concern, which points out the need for better water management and storage facilities to reduce excess high flows so the average actually occurs during droughts.

10. Page 22, Drainage Alterations. This section indicates that the Loxahatchee basin has declined from 270 to 210 square miles, yet page 13 of the document indicates that the

size of the basin has declined from 250 to 200 square miles. Please correct the discrepancy.

11. Page 26 - 27. The document notes that the largest oysters occur between river mile 4.0 and 6.0. Historically, where were the most productive oyster areas?

12. Page 32, third paragraph. The Hobe Grove Ditch was dug to the Loxahatchee River in the late 1960s. Sod farming has been a more recent agricultural change. The Chinese vegetable farm was operating years before sod farming was undertaken.

13. Page 34, second paragraph, and page 79. The 1973 USGS document by Harry Rodis concluded that a continuous flow of 50 cfs would only to protect the middle reaches of the river within the park, which only extends downstream to the Trapper Nelson Interpretive Site. The MFL technical document should more clearly describe the USGS report conclusions.

14. Page 43, Overview of Consumptive Uses Within the Watershed. What is meant by the term "combined average annual allocation?" Is this number the sum of all allocations divided by the number of permits? Instead, please provide the total annual allocation in the basin.

15. Page 44, Figure 10-A. Should "groundwater" be labeled as "surficial aquifer?" It is confusing to have "groundwater" labeled separately from "Floridan aquifer" unless a different aquifer is being used.

16. Page 44, first paragraph. This section notes that reclaimed water is disposed of in the wet season. Assuming water quality concerns could be met, what is the feasibility of storing this water for supplementing flows to the river during the dry season?

17. Page 59, Water Resource Functions Protected by MFL. This section indicates that water supply and flood protection are functions that should be protected by an MFL. The MFL is established to protect the water resource from significant harm, so the District can know what amount of water can be used for water supply or what effects the MFL will have on flood protection. The "water supply" and "drainage and flood protection" bullets should be removed from the list of items cited as being protected by an MFL. These are appropriate resource functions of the river and can be identified as functions, but the MFL should be established independent of these functions.

18. Page 66, Recreation. This section could benefit from including information about Jonathon Dickinson State Park's (JDSP) contribution to the local economy. JDSP encompasses 11,480 acres and attracts 169,768 visitors annually (1999-00), largely because of the Loxahatchee River and recreation that depends on it. According to research conducted by FSP, the total direct economic impact of JDSP on the local community is $5,101,443 annually. Deterioration of the ecology and aesthetics of the river are serious concerns that affect tourists and the local community.

19. Page 66, Recreation. This section should also include a description of the statutory responsibility of Florida State Parks when managing the JDSP. The DEP is compelled by Florida Statute 258.037 to establish a policy "to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them..."

20. Page 68, last paragraphs. One paragraph indicates that there is no detailed information on the role of groundwater providing base flows to the Loxahatchee, yet the next paragraph indicates that the effects of consumptive use permits are not very large. Additionally, on page 81, the document indicates that many of the data records reporting actual pumpage values from permit holders were missing or incomplete. It is difficult to understand how the report concludes that consumptive uses have little or no impact on the groundwater flows to the river, when little is known about the influence of groundwater on base flows to the river. The possibility remains that alternative sources may need to be developed for users to eliminate withdrawals that are indeed affecting river flow.

21. Pages 69-71, Consideration and Exclusions. The various references to water supply throughout this section implies that the effects of consumptive uses can be taken into consideration by the Governing Board when considering the effects of alterations pursuant to Section 373.042 (1)(a). While it is appropriate to identify these as functions of the waterbody, the water supply functions are not to be taken into account when establishing the MFL. Once the MFL is established, maintaining current water supply should not be included when determining the MFL. The statute explicitly prohibits allowing significant harm caused by withdrawals and the discussion in this section should include that statement. Water supply considerations can be factored into the recovery and prevention strategy, not the MFL establishment.

22. Page 69, first sentence and Page 107. The sentence on page 69 regarding monitoring of consumptive uses indicates that monitoring is conducted to prevent any decline in groundwater available to the river. This contradicts the statement on Page 107, which states that dry season impacts on flows are less that 5 cfs. Please clarify whether flows are impacted by groundwater withdrawals.

23. Pages 72-73, Exclusions. This section is confusing and could use some clarification. This section should clearly describe that the district is going to consider the effects of structural alterations to the water resource, except those associated with consumptive uses, as allowed pursuant to Section 373.042(1)(a). The District should provide more explanation about the provisions of 373.042(1)(b), which allows the District in certain situations not to establish MFL for certain waterbodies. This section would benefit from a summary statement that indicates that the District is going to consider the structural effects to the river but is still going to establish a MFL for the river.

24. Page 77, Table 15. The comparison table of river miles from different reports is helpful, but a better map with some specific locations would assist the reader.

25. Page 79. Why wasn't the data on sub-basin freshwater inflows reported in the Kitching Creek Study (conducted by Martin County and Florida State Parks) included in the development of the MFL criteria?

26. Page 80, first paragraph. This section indicated that long term salinity records were not available for the river at the vegetation survey sites. The document should describe the salinity records that were available.

27. Page 81, Documentation of Historic Water Use Within the Loxahatchee Basin. Is it possible for the District to provide the total amount of water permitted for withdrawal and the amount that is actually withdrawn within the Loxahatchee Watershed?

28. Page 83. According to the "Vascular Plants of Jonathan Dickinson State Park", sweet gum (*Liquidambar styraciflua*) is not found along the Northwest Fork.

29. Page 87, second paragraph. We think that estimating the amount of water that flowed from the watershed prior to development is relevant to developing a MFL and restoration targets. It is important to better understand how much water originally drove the system; a predevelopment water budget should be estimated.

30. Page 96, last sentence. MFLs are not simply to be maintained during conditions associated with regional drought. Low flow conditions may also be caused by overuse of the resource that could be occurring during average or wet conditions. This sentence implies that MFLs will only be in effect during droughts and should be deleted.

31. Page 97, Table 23. The data presented in the table does not correspond to the data collected by USGS and used in the Russell and McPherson report as referenced.

32. Page 98. Table 24 shows the historical record extends back to 1971. Has the District's research uncovered any earlier data on flows or levels in the Northwest Fork? Can this data be used?

33. Page 105, bullets 3 and 4, and Figure 22. The bullets indicate that only 2 permits authorize withdrawals showing greater than 0.1' drawdown, and only 4 permits authorize drawdowns greater than 0.1' drawdown in C-18 canal. Yet, Figure 22 shows more than 6 points of groundwater allocations with greater than 0.1' drawdown. This discrepancy should be explained in the document.

34. Page 106, Effects of Water Use. This section describes the singular effect of the various uses in the basin, but does not describe the cumulative effect of all these withdrawal points. This section should include a summary of a cumulative analysis of the withdrawals.

35. Page 106, Effects of Water Use. It would be helpful if the District provided information about the timing of withdrawals. Can the district show the amount of withdrawals that occurred during wet, average, dry, and extremely dry conditions? While the District notes that average flows at Lainhart Dam has increased (p. 140), it is also curious to note that during the same period, extreme low flows (< 10 cfs) increased by approximately 10%.

36. Page 112, Table 27. Many scientific names were misspelled in this table, please correct. Additionally, no mangrove species are listed in this table. Weren't these species counted and measured as part of the vegetative transects? They should have been present in the transects located downstream of river mile 9.

37. Page 115. The district should describe the difference between seedlings and saplings or provide definitions in the glossary.

38. Page 119, second paragraph. The coastal hammock community does not occur along the river, however there are hydric hammocks and one tropical hammock (see Jonathon Dickinson State Park's Unit Management Plan).

39. Page 121, second paragraph. Cabbage palms commonly occur in both upland and wetland habitats and are usually a dominant component of hydric hammocks. Please revise the statement that indicates cabbage palms are "normally" associated with upland communities.

40. Page 122, last paragraph, and page 132. The information used to reach the conclusion that vegetation has stabilized since 1985 seems to be based upon very limited information. It is quite possible that the decline is slight, but continued especially since there is no information on the health of the VEC community or the impacts to seedling germination and survival. The information presented seems to only support the conclusion that changes in the extent of cypress trees seem to have stabilized. As was noted earlier in the report, the canopy species may take longer to respond to stress than the rest of the floodplain community particularly the VEC community.

41. Page 125, Figure 29. From this analysis it appears that the construction of the C-18 canal had a much greater impact on the riverine community than the opening of the inlet.

42. Page 139, Table 36. The Ds and Db in Table 36 for sites 9B, 9C and 10B are much different from those in Table H-4 in Appendix H.

43. Page 139, third paragraph: The verbs should be in the past tense.

44. Page 140, 2nd Bullet. The dry season flows should also be provided here.

45. Page 148. Please explain how the proposed MFL criteria relates to the Stipulation for Consent Decree (Case No. 79-1910 CA (L) 01 C) between the Florida Wildlife

Federation and the South Florida Water Management District and the Florida Department of Environmental Regulation (now DEP).

46. Page 148. Harm Criteria. If flows at Lainhart falls below 35 cfs for more than 20 days, the MFL criteria will be exceeded and "harm" will occur to the floodplain. What resulting actions will the WMD take? If this happens more than once every six years, significant harm and an MFL violation occur. What resulting actions will the WMD take?

47. Page 153, paragraph preceding bulleted list. This paragraph indicates that 1984 was the year the NW Fork was designated a Wild and Scenic River, yet the rest of the document indicates 1985 was the year the river was designated as a Wild and Scenic River. Please clarify this contradiction.

48. Page 153, Management Targets. This section refers to a flow of 65 cfs, but does not provide a duration or frequency component, which results in a meaningless value. What exactly is meant by "providing 65 cfs flow whenever possible" and how will this affect the salinity along various sections of the river? To which point along the river will this flow target push the freshwater/saltwater interface? How long and how often is this expected to occur? It is premature to cite 65 cfs as a management target when the DEP and the District are in the process of determining appropriate restoration flows. Furthermore, care should be used within the document to indicate that this management target is not proposed as a reservation or the ultimate restoration goal for the river.

49. Page 153, Management Targets. The selection of 1985 as a baseline to determine management targets for the river, seems to have been arbitrarily selected. More explanation is needed to distinguish Management Targets from the MFL and restoration goals, if they are different. Since the vast majority of the damage to this river occurred prior to this date, and the mangrove encroachment has not substantially changed since 1985, setting 1985 as a baseline condition does not provide for meaningful restoration of the flow to the river.

50. Page 153, paragraph preceding the bottom bullets. The three management targets proposed are too limiting and does not include the scenario that allows for recovery of historical cypress community that has experienced significant harm. It is unclear how these targets relate to restoration goals and the MFL.

51. Pages 154 – 156, Phased Recovery Plan. The MFL phased recovery plan is based on implementation of projects identified in the NPBCCWMP and the Comprehensive Everglades Restoration Plan. The Loxahatchee River, an Outstanding Florida Water body, is afforded the highest protection pursuant to 62-302.700, Florida Administrative Code. As such, no degradation of water quality is permitted and all discharges to the Loxahatchee River shall meet state water quality standards. In addition, project components of CERP, pursuant to 373.1502(3)(B)(2), F.S., (Comprehensive Everglades Restoration Plan Recovery Act) shall not contribute to violations of the state water quality standards.

Specific/Editorial Comments (July 15, 2002 Draft)

52. Page 154, Recovery Plan. The plan needs more detailed explanation of how the proposed projects tie in with the recovery goals, so that we can better evaluate the plan. Many of the projects provide flood protection and water supply benefits and it is not clear how much these projects contribute to improving flows to the river. Is it possible to expedite critical projects that provide critical storage needs (such as installation of the G160 structure)?

53. Page 160, Operational Protocols. In the second paragraph it states that the District will continue to provide a flow of 50 cfs or greater over the Lainhart Dam while in the management target is stated as 65 cfs or greater. Please clarify this discrepancy.

54. Page 165, River Restoration. Please provide more details, including the action steps that specifically describe how this will occur. Additionally, details are needed that ensure appropriate restoration targets will be included as CERP projects are designed and developed.

55. Page 165, Estuarine Research. This section correctly notes the need to determine the effects of the proposed MFL on various components of the Estuary. Additionally, the section should note that the MFL will be revised as these studies are completed.

56. Page 165, Salinity Barrier Feasibility Analysis. For your information, several meetings were held, in 1975, and drawings were completed regarding this proposed structure. Except for the final design, this information is available at the District 5 Administration Office Florida State Parks.

57. Pages 166-168. The District should provide more details regarding this research effort including time lines for accomplishing each task, estimated costs, and funding sources.

58. Table of Contents. This needs to be correlated/updated with correct references to page numbers.

59. Appendices. The references to main document figures need to correlated/updated (example B-14 make reference to Figures 2 of main report, which probably should have referenced Figure 4).

60. Appendix A, Page A-7. Duever's referenced Figures A-1 and A-2 were not included.

61. Appendix I. Due to the "gross estimates" that this model generates, the calibration error of less than 10 CFS during 55 percent of the simulation period, the constant contributions assumed from each tributary, and the use of averages instead of extreme conditions, the value of 9 CFS proposed does not seem to be representative of what the actual effects could be.

62. Appendix O, Table O-3.This table shows that 32,961 MGD/year of water usage in the Loxahatchee watershed. This equates (32,961 x 1.55 divided by 365 = 139.9) to 140 cfs of daily watershed flow. The majority of this water usage is for urban water

supply of which most (63 percent) comes from groundwater. Although this flow may not be important in the wet season, it probably is a significant contributor to base flows during the dry season. As the dry season flows are the primary issue, it seems that existing and future water allocations could continue to reduce groundwater flows to the river unless water conservation practices, desalinization, or reuse reduce demand. Again, it also points out the need for improved water management and storage facilities to extend the hydroperiod during the dry season.

63. The document may be improved by some reorganization and elimination of redundancy.

    a. Chapter 2 and Chapter 3 should be combined. After the description of an aspect of the water body, immediately discuss the resource functions and considerations related to that aspect. In this way, some descriptions in Chapter 2 that are not important related to the MFL and recovery issues could be eliminated. Some repeated information and statements in Chapter 3 could also be deleted.

    b. Chapter 4 and Chapter 5 would also be better combined, following the same logic in the above comment. Combining chapters would allow repeated information and statements to be eliminated, and readers could more easily find the connection between the results and the methods.

    c. Chapter 4 and Chapter 5 would be improved if they were rewritten according to the criteria for establishing the MFL. In the current document, readers cannot easily find the information about where and how each element (criterion) of the MFL is determined. It would be better to have a specific, clear and logical description about how each element (criterion) of MFL is determined, in the following sequence:

        - baseline time (year) to establish MFL
        - indicators (Valued Ecosystem Components)
        - location (river miles) of significant harm
        - location of the flow measuring point
        - salinity threshold
        - maximum duration and frequency
        - threshold flow rate.

64. The following (underlined) may be errors:

    - Page 57, first paragraph: "...in all <u>the</u> of the other subbasins."
    - Page 86, second paragraph: "...in Table <u>29</u> were measured..."
    - Page 91, second paragraph: " Once the water resource... <u>and</u> specific technical...water body."
    - Page 93, third paragraph: "See also Table <u>22</u> of this report."
    - Page 115, third paragraph: "...the majority the six VEC species..."
    - Page 116, third paragraph: "...significant harm (Table <u>31</u>)."
    - Page 138, third paragraph: "...during 12% <u>of</u> of the simulation..."

Specific/Editorial Comments (July 15, 2002 Draft)

- Page 142, the footnote of Table 38: "…vegetation parameter (Ds/Db) was observed…"
- Page 144, second paragraph: "…up to 2 ppt (Figure 30)."
- Page 146, second paragraph: "(river mile 9.2)(Table 35)."
- Page 153, second paragraph: "…in 1984, at the time…"